Log Event A

Borehole # 21-08-07

Borehole Information

Farm : BX	**Tank :** BX-108	**Site Number :** 299-E33-152
N-Coord : 45,478	**W-Coord :** 53,484	**TOC Elevation :** 655.44
Water Level, ft :	**Date Drilled :** 1/31/1972	

Casing Record

Type : Steel-welded	Thickness : 0.280	ID, in. : 6
Top Depth, ft. : 0	Bottom Depth, ft. : 100	

Borehole Notes:
Borehole 21-08-07 was drilled in January 1972 to a depth of 100 ft with 6-in. casing. The casing thickness is presumed to be 0.280 in., on the basis of the published thickness for schedule-40, 6-in. steel tubing. The drilling log makes no mention of perforations or grouting; it is assumed that the borehole was not perforated or grouted. The top of the casing, which is the zero reference for the SGLS, is approximately 0.5 ft below the ground surface inside a plastic valve box.

Equipment Information

Logging System : 1B	**Detector Type :** HPGe	**Detector Efficiency:** 35.0 %
Calibration Date : 02/1997	**Calibration Reference :** GJO-HAN-14	**Logging Procedure :** P-GJPO-1783

Log Run Information

Log Run Number : 1	**Log Run Date :** 08/11/1997	**Logging Engineer:** Gary Lekvold
Start Depth, ft.: 0.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 11.5	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

Log Run Number : 2	**Log Run Date :** 08/12/1997	**Logging Engineer:** Gary Lekvold
Start Depth, ft.: 99.5	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 13.5	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

Log Run Number : 3	**Log Run Date :** 08/15/1997	**Logging Engineer:** Bob Spatz
Start Depth, ft.: 15.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 10.0	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

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Analysis Information

Analyst : D.L. Parker

Data Processing Reference : MAC-VZCP 1.7.9 Analysis Date : 12/10/1997

Analysis Notes :

This borehole was logged by the SGLS in three log runs. Log runs one and two were performed with the Gamma 1B logging system, and log run three was performed with the Gamma 2 logging system. It was intended that Gamma 1B would be used for the entire borehole, but logging run two had to be terminated when a cryogen cooling fan failed. The Gamma 2 logging system had to be used to finish logging the borehole.

All the pre- and post-survey field verification spectra met the acceptance criteria established for the peak shape and detector efficiency, confirming that the SGLS was operating within specifications. No post-survey verification spectra for were obtained for log run two because of the system failure. The energy calibration and peak-shape calibration were used to establish the channel-to-energy parameters used in processing the spectra acquired during the logging operation.

Casing correction factors for a 0.280-in.-thick steel casing were applied during analysis.

The man-made radionuclides detected around this borehole were Cs-137, Co-60, Eu-154, and Eu-152. The total count rate exceeded the SGLS capacity to produce a usable spectrum from 8 to 8.5 ft; therefore, identities and concentrations of radionuclides could not be determined in the interval from 8 to 8.5 ft. Cs-137 contamination was detected almost continuously from the ground surface to about 27 ft (except in the zone of high dead time) and from 30 ft to the bottom of the logged interval (99.5 ft). Distinct peaks in the Cs-137 concentrations were detected at about 5 ft, 34 ft, from 60 to 63 ft, and from 69.5 to 73 ft. Co-60 contamination was detected continuously from 33.5 to 52 ft, almost continuously from 69.5 to 72.5 ft, and at 59.5 and 61 ft. Eu-154 contamination was detected at 5 and 6 ft, and Eu-152 contamination was detected at 6 ft.

K-40 concentrations increase from 40 to 43 ft, and remain elevated to the bottom of the logged interval (99.5 ft).

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank BX-108.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations. Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

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A plot of the selected historical gross gamma logs is included. A plot of the shape factor analysis results is also included.